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Research Summary

Research Focus: Centered on hardware-inspired algorithm design—developing/optimizing medical imaging (PAI: PAM, PACT; OCT/PA dualmodal endoscopes) and hardware-tailored algorithms (FPGA signal acquisition, GPU image processing); integrating robotic systems (image-guided motion perception, real-time servoing) to build two platforms: extracorporeal (robot-enabled 3D/standardized imaging) and intracorporeal (continuum robots for mini-probe in-situ diagnosis); skilled in robotic hardware, imaging system, and algorithm development.

Professional Experience

- Mar. 2026 – Present ■ **Postdoctoral Researcher, Department of Biomedical Engineering, The Hong Kong Polytechnic University.**
Collaborating Advisor: *Prof. Nanguang Chen*
- Nov. 2025 – Feb. 2026 ■ **Postdoctoral Researcher, Centre for Artificial Intelligence and Robotics, Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences.**
Collaborating Advisor: *Prof. Hongbin Liu*

Education

- 2021 – 2025 ■ **Ph.D., The Chinese University of Hong Kong** in Electronic Engineering.
Supervisor: *Prof. Max Q.-H. Meng*
- 2018 – 2021 ■ **Master's degree, University of Chinese Academy of Sciences** in Electronic Engineering.
Supervisor: *Prof. Fei Gao*
- 2014 – 2018 ■ **Anhui University of Technology** in Mechatronics Engineering.

Research Publications

Manuscripts Under Review

- 1 L. Shen, Y. Zhao*, and Y. Chen, “Homr-net: Hierarchical orthogonal moment reasoning for pansharpening,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2026, Under Review; IF=20.4, JCR Q1.
- 2 **Y. Zhao**, F. Gao*, and M. Q.-H. Meng*, “Vistapact: Perception-guided robotic photoacoustic tomography for surface-aware 3-d vascular imaging,” *IEEE Transactions on Medical Robotics and Bionics*, 2026, Under Review; IF=4.3, JCR Q2.

Journal Articles

- 1 Z. Li, L. Huang, Q. Sun, Y. Zhao*, ..., and H. Zheng, “3d acoustic imaging hitting the diffraction limit via fully parameter-optimized meta-lens and frequency-domain reconstruction,” *Advanced Materials*, e08453, 2025, IF=29.1, JCR Q1.  DOI: 10.1002/adma.202508453

- 2 **Y. Zhao**, L. Shen, F. Gao, N. Chen, and M. Q.-H. Meng, "Spectral servoing: Dct-optimized robotic photoacoustic tomography for vascular plane revisitation in pilot human studies," *IEEE Transactions on Automation Science and Engineering*, 2026, Accepted; IF=7.9, JCR Q1.
- 3 **Y. Zhao**, L. Shen, H. Lan, Y. Liang, F. Gao, and N. Chen, "Robot-assisted wide-amplitude oscillatory photoacoustic scanning for three-dimensional human peripheral vascular imaging: A preliminary feasibility study," *Photoacoustics*, 2026, Accepted; IF=6.9, JCR Q1.
- 4 L. Liu, A. Li, Y. Zhao, L. Zhu, Y. Zhao*, and F. Gao, "An umbrella-inspired snap-on robotic 3d photoacoustic endoscopic probe for augmented intragastric sensing: Proof of concept study," *Photoacoustics*, vol. 35, p. 100 568, 2024, IF=6.9, JCR Q1.  DOI: 10.1016/j.pacs.2023.100568
- 5 **Y. Zhao** et al., "A light-adjustable hand-held probe for photoacoustic tomography in vivo," *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 27, no. 4, pp. 1–11, 2020, IF=4.5, JCR Q1.  DOI: 10.1109/JSTQE.2020.3024954
- 6 **Y. Zhao** et al., "Robotic repositioning of photoacoustic tomography for reproducible long-term monitoring of peripheral artery in vivo," *IEEE Transactions on Medical Robotics and Bionics*, vol. 6, no. 2, pp. 410–418, 2024, IF=4.3, JCR Q2.  DOI: 10.1109/TMRB.2024.3371542
- 7 **Y. Zhao**, Z. Li, L. Liu, and M. Q.-H. Meng, "Robotically steerable intraluminal imaging probe with side-viewing 3d photoacoustic computed tomography," *Optics Letters*, vol. 49, no. 21, pp. 6089–6092, 2024, IF=3.3, JCR Q2.  DOI: 10.1364/ol.539670
- 8 **Y. Zhao**, L. Liu, A. Li, L. Zhu, H. Lan, and F. Gao, "Design of continuously-adjustable light-scanning handheld probe for photoacoustic imaging," *IEEE Photonics Journal*, vol. 13, no. 5, pp. 1–6, 2021, IF=2.6, JCR Q3.  DOI: 10.1109/JPHOT.2021.3115966
- 9 **Y. Zhao** et al., "Development of a compact photoacoustic tomography imaging system with dual single-element transducers for image enhancement," *Current Medical Science*, vol. 41, no. 6, pp. 1151–1157, 2021, IF=2.0, JCR Q3.  DOI: 10.1007/s11596-021-2482-3
- 10 L. Liu, **Y. Zhao**, A. Li, ..., and M. Q.-H. Meng, "A photoacoustics-enhanced drilling probe for radiation-free pedicle screw implantation in spinal surgery," *Frontiers in Bioengineering and Biotechnology*, vol. 10, p. 1 000 950, 2022, IF=5.8, JCR Q1.  DOI: 10.3389/fbioe.2022.1000950
- 11 J. Wang, Y. Zhao, F. Gao, and **Y. Zhao**, "Adaptive piecewise euler-bernoulli beam model for tendon-actuated soft slender manipulator," *Applied Mathematics and Mechanics*, vol. 47, no. 7, pp. 1469–1486, 2026, IF=4.9, JCR Q1.
- 12 A. Li, J. Han, **Y. Zhao**, K. Li, and L. Liu, "Realistic ultrasound synthesis based on diagnostic ct to facilitate ultrasound-guided robotic spine surgery," *IEEE Transactions on Medical Robotics and Bionics*, vol. 5, no. 4, pp. 879–889, 2023, IF=4.3, JCR Q2.  DOI: 10.1109/TMRB.2023.3310201
- 13 Y. Wang, Y. Chen, **Y. Zhao**, and S. Liu, "Compressed sensing for biomedical photoacoustic imaging: A review," *Sensors*, vol. 24, no. 9, p. 2670, 2024, IF=4.0, JCR Q2.  DOI: 10.3390/s24092670
- 14 S. Liu, X. Feng, D. Jiang, F. Gao, **Y. Zhao**, and L. Liu, "Virtual wave based phasor field projection for photoacoustic imaging," *Applied Physics Letters*, vol. 122, no. 9, 2023, IF=3.8, JCR Q2.  DOI: 10.1063/5.0138848

Conference Proceedings

- 1 **Y. Zhao**, D. Jiang, H. Lan, and F. Gao, "Image infusion of photoacoustic imaging based on novel adjustable hand-held probe," in *2019 IEEE International Ultrasonics Symposium (IUS)*, IEEE, 2019, pp. 2366–2368.  DOI: 10.1109/ULTSYM.2019.8925946
- 2 **Y. Zhao**, Y. Shen, L. Zhu, L. Liu, and F. Gao, "Design of scanning robot for atherosclerosis detection via photoacoustic imaging," in *2021 IEEE International Conference on Real-time Computing and Robotics (RCAR)*, IEEE, 2021, pp. 714–719.  DOI: 10.1109/rcar52367.2021.9517658

- 3 **Y. Zhao**, S. Yu, B. Tao, and F. Gao, “Adjustable handheld probe design for photoacoustic imaging: Experimental validation,” in *2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, IEEE, 2019, pp. 7119–7122.  DOI: 10.1109/EMBC.2019.8856595
- 4 A. Li, **Y. Zhao**, F. Bai, J. Han, M. Q.-H. Meng, and L. Liu, “A zero-shot domain adaptation framework for computed tomography via reinforcement learning and volume rendering,” in *2024 IEEE International Symposium on Biomedical Imaging (ISBI)*, IEEE, 2024, pp. 1–5.  DOI: 10.1109/isbi56570.2024.10635880